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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,656	08/02/2001	Reinhard Schauer	SCHAUER ET A	6290

25889 7590 01/13/2003

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EXAMINER
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TRAN, THIEN F

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 01/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/890,656

Applicant(s)

SCHAUER ET AL. *be*

Examiner

Thien F Tran

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-24 is/are pending in the application.
- 4a) Of the above claim(s) 16-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2811

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of claims 13-15 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that a simultaneous search for all of the groups would not constitute an unreasonable search for the examiner. This is not found persuasive because the product and process are located in different classes placing an undue burden upon the examiner.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wijaranakula et al. (USPN 6,022,793) in view of Graef et al. (USPN 5,935,320).

Wijaranakula et al. discloses a semiconductor wafer comprising a substrate wafer made of monocrystalline silicon and an epitaxial layer deposited thereon; said substrate wafer having a resistivity of from 0.1 to 50  $\Omega\text{cm}$ , an oxygen concentration; the epitaxial layer has a thickness less than 1  $\mu\text{m}$ . Wijaranakula et al. does not disclose the oxygen concentration of less than  $7.5 \times 10^{17} \text{ atcm}^{-3}$  and a nitrogen concentration of from  $1 \times 10^{13}$  to  $5 \times 10^{15} \text{ atcm}^{-3}$ . Graef et al. discloses a process for producing silicon semiconductor wafers with low defect density, wherein a substrate wafer having an

Art Unit: 2811

oxygen concentration of  $4.5 \times 10^{17} \text{ atcm}^{-3}$  and a nitrogen concentration of  $2.5 \times 10^{14} \text{ atcm}^{-3}$  (see Fig. 6). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the substrate wafer of Wijaranakula et al. having an oxygen concentration of  $4.5 \times 10^{17} \text{ atcm}^{-3}$  and a nitrogen concentration of  $2.5 \times 10^{14} \text{ atcm}^{-3}$  using the process taught by Graef et al. in order to provide silicon wafers with low defect density after annealing. The modified Wijaranakula et al. has the same structure as claimed, it is inherent that the epitaxial layer has a surface on which fewer than 30 LLS defects with a size of more than 0.085  $\mu\text{m}$  can be detected.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien F Tran whose telephone number is (703) 308-4108. The examiner can normally be reached on 8:30AM - 5:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/890,656

Page 4

Art Unit: 2811

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January 9, 2003



Thien Tran  
Patent Examiner  
Technology Center 2800